

- 22 -

C L A I M S

1. System for making a hole in an object, the system comprising jet means for generating an abrasive jet of a mixture containing a fluid and a quantity of abrasive particles and for blasting the abrasive jet with an erosive power into impingement with the object in an impingement area, thereby eroding the object in the impingement area, the system further comprising scanning means for moving the impingement area along a selected trajectory in the hole, and modulation means for modulating the erosive power of the abrasive jet while the impingement area is being moved along the selected trajectory.
2. The system of claim 1, wherein the scanning means comprises rotary means for rotating the abrasive jet about a rotary axis, whereby the impingement area is positioned off-axis with respect to the rotary axis.
3. The system of claim 1 or 2, wherein the modulation means comprises modulation control means arranged to control the modulation means such that the erosive power of the abrasive jet is modulated in relation with the position of the impingement area on the selected trajectory.
4. The system of any one of claims 1 to 3, comprising a positional sensor for providing a signal indicative of the position of the impingement area on the selected trajectory.
5. The system of any one of claims 1 to 4, comprising a navigational sensor for providing a signal indicative of a direction under which the making of the hole in the object progresses.

- 23 -

6. The system of any one of claims 1 to 5, wherein the modulation means comprise means for modulating the power vested in kinetic energy of the abrasive particles.

5 7. The system of any one of claims 1 to 6, wherein the modulation means comprises velocity control means arranged to modulate the velocity of the abrasive particles in the abrasive jet.

10 8. The system of claim 7, wherein the jet means comprises an acceleration nozzle across which a pressure drop is maintainable, whereby the velocity control means comprises pressure control means arranged to modulate the pressure drop.

15 9. The system of any one of claims 1 to 8, whereby the modulation means is arranged to modulate the quantity of abrasive particles in the mixture.

20 10. The system of claim 9, comprising a mixing chamber for mixing the fluid with the abrasive particles, and further comprising abrasive particle supply means for supplying the abrasive particles to the mixing chamber, whereby the modulation means is arranged to modulate the rate at which the abrasive particle supply means supplies the abrasive particles to the mixing chamber thereby modulating the quantity of abrasive particles in the mixture.

25 11. The system of claim 10, wherein the abrasive particle supply means comprises recirculation means arranged to recirculate at least a part of the abrasive particles from a return stream of the mixture downstream impingement with the object into the mixing chamber, 30 whereby the modulation means is arranged to modulate at least the recirculation rate.

35 12. The system of claim 10 or 11, wherein the abrasive particle supply means comprises conveyor means, preferably in the form of a movable magnet, arranged such that operation of the conveyor means induces transport of

- 24 -

the abrasive particles, whereby the modulation means is arranged to modulate at least the rate of transport induced by the conveyor means.

5 13. The system of claim 12, wherein the conveyor means is movable, whereby movement of the conveyor means induces the transport of the abrasive particles.

10 14. The system of claim 12 or 13, wherein the conveyor means are coupled to a controllable down hole power system for operating the conveyor means, preferably for driving the conveyor means into movement.

15 15. The system of claim 14, wherein the controllable down hole power system comprises an electric power generator drivable by a fluid flow, an electric motor mechanically coupled to the conveyor means for driving the conveyor means into movement, whereby the electric motor is electrically coupled to the electric power generator via an electronic control system.

20 16. Method of making a hole in an object, the method comprising steps of
- generating an abrasive jet of a mixture containing a fluid and a quantity of abrasive particles;
- blasting the abrasive jet with an erosive power into impingement with the object in an impingement area, thereby eroding the object in the impingement area;
25 - moving the impingement area along a selected trajectory in the hole; and
- modulating the erosive power of the abrasive jet while the impingement area is being moved.

30 17. The method of claim 16, wherein modulating the erosive power of the abrasive jet comprises modulating the power vested in kinetic energy of the abrasive particles.